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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/840,178	04/24/2001	Toshifumi Nagaiwa	206342US2	2640

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EXAMINER

KACKAR, RAM N

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 06/20/2002

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/840,178

Applicant(s)

NAGAIWA ET AL.

Examiner

Ram N Kackar

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 July 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 13-20 is/are rejected.
- 7) ☒ Claim(s) 12 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 1.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 13, 14 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Noda Yasutoshi. Noda Yasutoshi discloses a process chamber for semiconductor process, having means for process gas and vacuum, means for exciting plasma (Drawing 1), a work table device comprising an electrostatic chuck having passage for cooling (Para 16), a main surface (Drawing 1 3a) for substrate and a sub-surface for a focus ring (Drawing 1-7), cooling mechanism for both main surface (Para 16) and sub-surface (Drawing 1-7) and a heat transfer medium for focus ring (Para 17).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2-3, 8, 15 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noda Yasutoshi in view of Faretra (US Patent Nr 4282924). Noda Yasutoshi does not explicitly disclose that the heat transfer medium for focus ring is a solid material. Faretra discloses use of thermally conductive silicon rubber as a heat transfer medium (Col 3 line 35-36, line 63-68 and

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Col 4 line 1-2). Regarding claim 8, it would have been well known in the art that a large area of contact was needed to have an efficient heat transfer. Faretra discloses the same in (Col 3 line 35-36). Therefore it would have been obvious to one having ordinary skill in the art at the time invention was made to employ a mechanism to press focus ring on to the subsurface to make sure of a good thermal contact to the transfer medium.

5. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Noda Yasutoshi in view of Faretra (US Patent Nr 4282924) as applied to claim 2 and further in view of Lilleland et al (US Patent Nr 6148765). Noda Yasutoshi discloses that a good conducting material is stuck under the focus ring but does not explicitly disclose the use of an adhesive. Lilleland et al disclose use of thermally conductive elastomeric joint (Abstract). Therefore it would have been obvious to one having ordinary skill in the art at the time invention was made to use a material like this to make a thermally conductive joint to the focus ring for good thermal and mechanical bond.

6. Claims 5-6 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noda Yasutoshi in view of Tsukamoto (US Patent Nr 5868848). Noda Yasutoshi does not explicitly disclose that the heat transfer medium for focus ring is a coolant inert gas. Use of inert gas like helium as heat transfer medium gas was well known in the art as disclosed by Tsukamoto (Col 3 line 65-68). Therefore it would have been obvious to one having ordinary skill in the art the time invention was made to use an inert gas like helium for its conductive heat transfer property.

7. Claims 7 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noda Yasutoshi in view of Faretra (US Patent Nr 4282924) as applied to claim1 and 15 and further in view of Lu et al (US Patent Nr 5904778). Noda Yasutoshi does not expressly disclose that the

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focus ring consists of a conductive material but both Noda Yasutoshi (Para 17) and Faretra disclose that the heat transfer medium is conductive (Col 3 line 63-68). Lu et al discloses that focus ring can be made of heat conductive material like silicon carbide (Col 10 table 4 first entry). Therefore it would have been obvious to one having ordinary skill in the art the time invention was made to use thermally conductive silicon carbide for focus ring for its efficient cooling.

8. Claims 9-11 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noda Yasutoshi in view of Faretra (US Patent Nr 4282924) as applied to claims 8 and 18 and further in view of Shahvandi et al (US Patent Nr 5405491). Faretra discloses the need to press focus ring on to subsurface but does not disclose that the means for pressing are a clamp. Shahvandi et al disclose a clamp mechanism for clamping flat horizontal objects from above and an extending portion extending downward and fixed to a fixing member (Fig 3-42), made substantially of ceramic (Fig 3 - 40 and Fig 4-46). Therefore it would have been obvious to one having ordinary skill in the art the time invention was made to use a clamp for pressing the focus ring on to subsurface for good cooling.

Allowable Subject Matter

9 Claim 12 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

10 The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

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US Patent Nr 5556500, 5792304, 5304278 and Japanese Patents 11-067717.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ram N Kackar whose telephone number is 703 305 3996. The examiner can normally be reached on M-F 8:00 A.M to 5:P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on 703 308 1633. The fax phone numbers for the organization where this application or proceeding is assigned are 703 872 9310 for regular communications and 703 872 9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0661.

RK
June 17, 2002.


GREGORY MILLS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700